Response to SSP RFI

presented by

Manned Space Flight Education Foundation, Inc.

“Welcome home…”

Houston – the final destination for a space shuttle orbiter

Introduction

"Houston, Tranquility base here. The Eagle has landed." These words, the first spoken on the surface of the moon, exemplify the significance that Houston, Texas has played in the history of space flight. Home to NASA's Johnson Space Center, Mission Control, and the Astronaut Corps, "Space City USA" is uniquely qualified to house and showcase one of our nation's finest assets, the space shuttle orbiter and its main engines.

As the longest human spaceflight endeavor in history, NASA's Space Shuttle Program has profound roots and a living legacy in Texas. Tens of thousands of local professionals – from civil servants to industry contractors – have played an integral role in the program's development and execution over the past four decades. In fact, with every shuttle mission since inception in 1981, it is Houston personnel at the helm; from when the vehicle clears the tower, until wheel-stop upon landing and through the crew's public debrief. It is Houston that gave birth to the shuttle; her patent held here, her design drafted here, her systems created here.

NASA - JSC Mission Control

Space Center Houston, a project of Manned Space Flight Education Foundation, Inc. (MSFEFI), has viable plans to display and exhibit this American icon at its space tourism complex – the Official Visitor Center of NASA's Johnson Space Center (JSC). Space Center Houston is an educational, entertainment complex serving as the public window on the world's most exciting scientific initiative … the American space program. Thanks to a magical mix of interactive exhibits, films, tours and live presentations, learning about space science and technology is inspiring, enjoyable and educational.

Until the 1990's, people toured JSC through an informal visitor's center which was open to the public and was located in an employee auditorium converted to display space artifacts and models. Harold Stall, former Director of Public Affairs at JSC, likened it to "showing off the Hope diamond in a shoe box." To better showcase the amazing accomplishments of JSC and the nation's space program, MSFEFI was formed in 1986. As a 501(c)(3) educational non-profit organization pioneered by community leaders and representatives from JSC, the goal was to develop a visitor center with ticketed admission to ensure the education for every generation regarding space exploration and related areas of science and technology.

Since opening its doors in 1992, Space Center Houston has been a highly regarded tourist attraction and education venue, rated number one amongst museums by numerous organizations including Texas Highways and Texas Monthly. The success of this center and its longevity for providing intelligent fun, make housing one of the nation's most identifiable icons a natural fit. The space shuttle orbiter embodies all of those things that comprise our space industry and our pre-eminent role in human space flight: vision, courage, engineering, technology, systems and the missions it made possible.

The initiative to acquire a flown space shuttle and main engines is broadly based and supported by: MSFEFI and its special relationship with JSC; business and civic leaders; the Bay Area Houston Economic Partnership and its 270 members; engineers, scientists and astronauts; as well as our elected officials, including the members of the Texas state delegation.

1.0 Acquiring an Orbiter and SSME - Purpose and Location

Space Center Houston is the gateway to NASA's Johnson Space Center. Its mission is to serve as a world-class attraction dedicated to inspiring, entertaining and educating every generation about space exploration and its benefits to humankind. At this site we feature a multitude of permanent displays, attractions and theatres, specializing in space exploration. In addition, the venue presents an amazing array of traveling exhibits and remarkable events. Visitors can also experience a "behind-the-scenes" look at JSC and the American space program on one of the tram tours offered at the complex.

This $69-million, 183,000-square-foot intelligent-fun complex has entertained and informed more than 12 million star-struck visitors from every corner of the globe. Averaging approximately 750,000 visitors each year, Space Center Houston has become one of Texas' top attractions, generating more than $242 million in total revenue since inception. We intend to expand upon this educational and inspiring venue with the addition of an orbiter and space shuttle main engine (SSME) facility that preserves the history and accomplishments garnered through the space shuttle era.

Space Center Houston

With education as a focus, the orbiter will be permanently displayed in an interactive learning environment, connected to the current complex which is adjacent to JSC. It will be a tremendous addition to the timeline of space accomplishments and artifacts currently on display, which include actual flown Mercury, Gemini and Apollo capsules, rockets and a Skylab trainer. With classroom facilities, hands-on exhibits and a chronicle of the nation's space program, the space shuttle will serve as the centerpiece, forever reminding us all of humankind's exploring spirit.

2.0 Funding Approach

Space Center Houston has a proven history of successful financing and operations. The following details our means for securing the needed funds to construct a full-service education and entertainment complex, as well as our approach and timetable for financing and constructing this addition that will appropriately house the space shuttle orbiter and its engines.

2.1 Funding Success Story

Space Center Houston opened to the public on October 16, 1992. The 88-acre site adjacent to JSC is licensed to MSFEFI until 2041. Through sound operational and financial management, we rely on only modest annual fundraising and sponsorship efforts.

Initial funding for the visitors center came from the issuance of tax-exempt bonds through the Harris County Cultural Education Facilities Finance Corporation. Richard Allen, President and CEO, joined Space Center Houston in 1995. Under Allen's leadership, a program of debt restructuring was accomplished in February 1996. This reduced the debt by approximately $20 million and aligned payments with anticipated visitation and revenue numbers. At this same time, we began using our main plaza for traveling exhibits which change at least three times a year. The temporary exhibits keep the experience fresh and encourage visitors to return. Since then, this approach had been quite successful, garnering valued ratings to include being listed as Houston's #1 attraction numerous times.

Unlike most museums, Space Center Houston has not relied on endowments to fund operations, yet has been consistently able to generate revenue, keep the facility updated and regularly rotate exhibits to generate repeat business. We have taken a prudent management approach that promotes financial transparency. Our historical coverage of maximum annual senior debt service has been consistently more than twice the required amount, indicating financial security and stability. As a result of these financial accomplishments, Standard & Poor's, a leading provider of financial market intelligence, raised our bond rating in 2008 to class BBB-, demonstrating confidence in business operations and minimized risk in investment potential.

"The space shuttle exhibit is expected to increase Space Center Houston's current $45-million annual regional economic impact. Moreover, the project's construction will generate another $29 million in business value and over 750 jobs."

~ Robert F. Hodgin, PhD
University of Houston-Clear Lake Associate Professor of Economics

We file our financial statements with Dun & Bradstreet, the world's leading source of commercial information and insight on businesses, making all information available to the public, further elevating our financial rating. The Better Business Bureau, a national watchdog of business practices and ethics, reviews all filings, ensuring our operations meet not-for-profit giving guidelines. Where most competitors simply undergo annual reviews, we participate in a full, certified audit, continuously upholding ourselves to the highest standards of financial performance and scrutiny. Every audit has carried a clean opinion. Annually, we file the Form 990 Return of Organization Exempt from Income Tax with the Internal Revenue Service, who reviews each submission.

We have also successfully completed the Museum Assessment Program, conducted by the Institute of Museum and Library Services. This program is an assessment tool that offers an outside perspective, helping museums plan their sustainability through a process of self-study and peer review. Specific areas of analysis included collections management, institutional practices, governance and public dimension.

Using this proven model for success and applying the assistance of a professional fundraising provider, we have developed a feasible financing profile. Through execution of this approach, we believe the result is an educational and inspiring facility that showcases historical artifacts today and that will become an outstanding location to feature America's space shuttle.

2.2 Funding Sources

We commissioned a survey in 2007 to determine state-wide interest in securing an orbiter within Texas. Those polled lived in Houston, Dallas and San Antonio. Awareness of our facility was high, with 92% of all respondents knowledgeable about Space Center Houston and JSC. Findings show that the impact of obtaining a retired space shuttle would be significant on attendance, generating interest for many who have not yet visited the complex as well as stimulating interest for repeat visits by others. These results help validate that undertaking the financial obligations for this project are feasible.

Due to the size of the project, our financing plan calls for a viable mix of private and government contributions. We will be looking at a variety of funding vehicles to include: gifts, grants and state and federal appropriations. Based on the feasibility study conducted by our fundraising organization, it is expected that approximately 60% of funding sources will be derived from private and public funding to include a lead gift provider that is likely to be provided with facility naming rights. The remaining 40% is expected to come from state and federal funding sources.

Entrance to Space Center Houston

We engaged the services of a professional fundraising organization to assess the current market. Their appraisal evaluated the potential for obtaining the resources necessary to acquire an orbiter and construct a facility that not only appropriately houses this American treasure but also provides for enhanced education and outreach opportunities. Results suggest that in the current economic climate fundraising challenges exist, and they will need to be addressed in the full-scale funding plan. However, there is strong consensus by the many who participated in the assessment that these challenges can be overcome and that it would be appropriate to call Houston home to one of our most prized space-faring vehicles.

2.3 Funding Timetable

Based on the funding profile and campaign strategy to develop a world-class facility, it is estimated that 30 months is required to reach or exceed the campaign goal. This schedule was determined via an analysis conducted by a recognized leader in community and economic development fundraising. This organization conducted interviews with key leaders to assess public attitudes, levels of support and fundraising capabilities.

The amount required to obtain the orbiter and construct a proper facility is considered a formidable but achievable challenge. As such, the board of directors has agreed to significantly enhance its membership from 13 to a maximum of 35, soliciting the services, capabilities and reach of this expanded group to achieve this bold endeavor. These added members are highly-regarded professionals experienced at securing resources needed for ventures such as this. Committees charged with development as well as with facility construction and management are being formed for careful oversight, and a full-time Director of Development has been added to the exemplary management team.

During this fundraising campaign period, a detailed plan for securing the financing required to achieve program goals will be employed. Aspects of the campaign include:

- Development of fundraising plan details
- Determination and execution of grassroots strategy
- Identification of contributor prospects
- Securing of lead gift provider
- Development and pitching of campaign materials and collateral
- Completion of grant writing process
- Development and implementation of funding campaigns
- Management of major gifts solicitation process
- Implementation of campaign communications and public relations initiatives
- Resolution of all pending solicitations

3.0 Exhibit Management

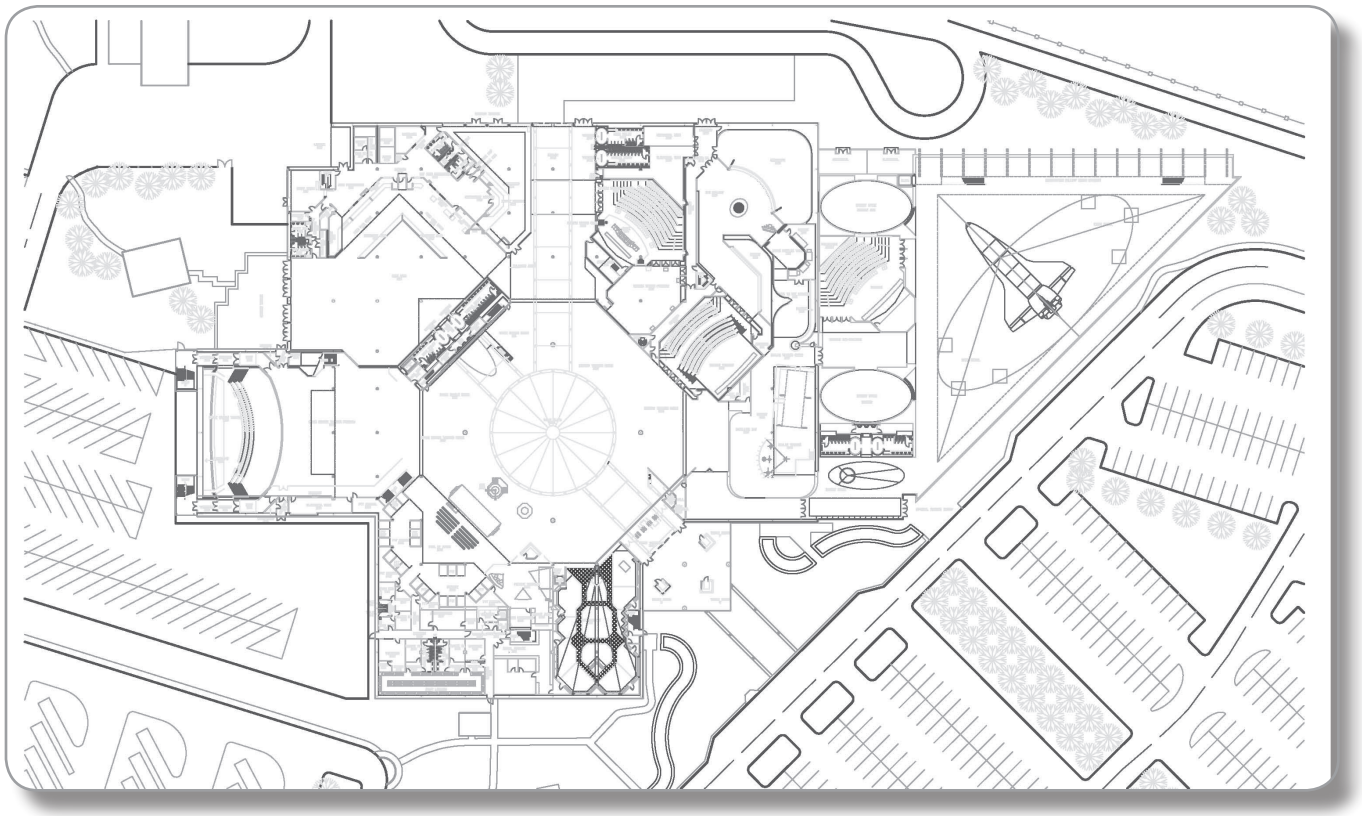
Space Center Houston has a long-standing history of showcasing rare artifacts. As an iconic piece of American history, technology and space exploration, the space shuttle exhibit will become a Texas landmark on its own. Having extensive experience with national treasures, we are highly conversant on what it will take to obtain possession of the shuttle, provide for its temporary storage, manage the aspects of secure transportation, construct a suitable facility, provide a quality and meaningful visitor experience and maintain this precious article.

The following sections demonstrate our ability to appropriately house, protect, display and curate a space shuttle orbiter and its engines.

3.1 Facility Overview

Employing the skills of the qualified architectural firm that designed our original facility, we have already developed preliminary plans to confirm the location and possible configuration of the shuttle facility. The firm verified that we have adequate space to enclose the shuttle in a controlled environment building, attach it to the existing infrastructure and provide areas for pre-show, exhibits and other quality display components. As such, we will construct a facility adjacent to our existing museum and edutainment complex. Encompassing approximately 53,000 square feet, the new shuttle exhibit and education center will have minimal impact on existing buildings, parking and infrastructure, which were designed by our firm with facility growth in mind.

An initial schematic of the facility and its proximity to existing Space Center Houston facilities is shown below. The visitors' experience will include state-of-the-art interactive technology and the exhibit will accommodate a large number of guests.



Facility Augmentation for Orbiter

3.2 Artifact Display and Care

Since opening our doors, we have displayed some of the nation's most elite flight articles flown in space, including Mercury, Gemini and Apollo capsules. Additionally, we have numerous exhibits provided on loan from nationally recognized motion picture organizations, museums and education providers. With an established partnership with JSC's External Affairs and their exhibits personnel, we have the necessary processes and procedures in place to ensure quality control, proper display and exceptional care of all display items.

With facility reports and loan agreements in place with JSC, we have been able to exhibit numerous National Air and Space Museum (NASM) artifacts, entrusted with their care and conditioning. These facility reports detail how we ship, store, handle, display and safeguard the facility and its assets, ensuring their security and protection from people, the environment, contaminants and natural degradation. Artifact displays strictly adhere to American Association of Museums and NASM standards. Additionally, we work hand-in-hand with JSC personnel, whenever required, adhering to NASA Procedural Requirement 4310.1 - Identification and Disposition of NASA Artifacts. We have extensive experience working with organizations such as the Association of Science-Technology Centers, Inc. for their exhibition services, also requiring facility reports that demonstrate the proper use, care and security of their displays.

In addition to facilitating the care of our displays and exhibits, we have standard operating procedures that support the operations, maintenance and customer experience of the entire facility. Highlights of these procedures include:

- **Wayfinding and visitor flow planning** – The exhibits department works with the exhibit design contractor to design visitor flow. Directional signage is recognizable and easy to understand. Operations and safety management teams are consulted.
- **Facility and exhibit safety** – The exhibits department works with the facilities and security/safety departments on building and exhibit designs to ensure a safe experience for visitors.
- **Hazard identification and abatement** - The exhibits, facilities and security/safety departments work with NASA to identify any potential hazardous concerns and employ solutions to eliminate risk. The exhibits department also works with NASA to understand proper procedures concerning any work to be accomplished around possible hazardous conditions.
- **Building commissioning** – The facilities department works with the security/safety and exhibits departments to ensure the new building's subsystems (HVAC, plumbing, electrical, fire/life safety and building security) are operating as intended and as designed by the building architects and engineers.
- **Environmental conditioning** - The exhibits department works with the facilities department to ensure the building achieves optimum interior environment conditions for the proper display of artifacts. We ensure the environmental conditions for humidity, temperature, filtration and lighting are met as intended by Space Center Houston and as designed by the building architects and engineers.
- **Facility protection and security** - The exhibits, facilities and security/safety departments work together to ensure a secure building as well as provide proper protection and safety of artifacts.
- **Disaster recovery and business continuity management** - The exhibits, operations, facilities and security/safety departments work together to create proper procedures to protect the building and artifacts in the event of a disaster. The team will see that new procedures for the space shuttle facility are implemented into the existing disaster recovery policies and procedures.

"Houston and NASA share a long and celebrated history that has become part of the fabric of the city's culture and livelihood. Considered the home of human spaceflight, Houston has been a key partner in space exploration over the years. I believe the retired Space Shuttle is a fitting symbol of this partnership. Awarding this icon and national treasure would honor the city of Houston and its contribution and commitment to NASA and the Space Program."

~The Honorable Kay Bailey Hutchison, United States Senator

With the addition of the space shuttle exhibit, we will be enhancing our curatorial process through the development and implementation of a comprehensive preservation management plan. Space Center Houston was the recent recipient of the *Connecting to Collections Bookshelf*. The gift from the Institute of Museum and Library Services is a set of resources containing informative and practical materials to help institutions sustain their heritage by improving the care of their collections. Work has already begun to initiate the protocols and processes needed to fully employ a thorough preservation management system. As part of this system, an artifact document will be employed and will assist us in recording the shuttle's specific history, detailed components, important features and methods for ensuring its protection from natural deterioration and visitor impacts. The document will delineate which components require special protection and which areas merit rehabilitation, if required. The preservation management plan guides future maintenance, repairs and alterations to ensure the longevity of this unique artifact.

3.3 Export Control

We have extensive experience exhibiting and protecting artifacts that are classified as "Defense Articles" under 22 C.F.R. section 120.6 of the International Traffic in Arms Regulations (ITAR). Defense Articles that we have on display as NASA artifacts include a life-size space shuttle orbiter mock up, lunar lander, Saturn V rocket, moon rocks, Mecury, Gemini and Apollo capsules, T-38 training aircraft and several rocket motor engines, rockets and components of defense articles such as heat resistant tiles.

We will take the following actions to prevent unauthorized access by non-U.S. persons to the orbiter and engines (which might constitute an unauthorized export). During the delivery and installation, the orbiter and engines will remain under the effective control of U.S. persons responsible for securing the items and all components to prevent damage, theft or unauthorized access. Once received at Space Center Houston, the orbiter and engines will be exhibited to the public as static displays which will allow them to be viewed while restricting physical approach. The orbiter will be displayed in a manner that prevents members of the public from touching, climbing upon or entering the vehicle.

We have no plans or intent to export the orbiter or engines in whole or in part. In the event that we are directed by an authorized government entity, such as NASA, to export or provide non-U.S. persons with access to the exhibit, we will ensure that the appropriate export license authority is obtained from the U. S. Department of State Directorate for Defense Trade Controls.

4.0 Acceptance Schedule

We anticipate being fully prepared to take delivery of the space shuttle orbiter and engines by May 31, 2012. The shuttle carrier aircraft would deliver the orbiter to Ellington Airport, a landing strip and facility previously used for resting and refueling operations when transferring the orbiter from Dryden to Kennedy. Should the new addition at Space Center Houston not be fully complete, we are making provisions for proper temporary storage and security at Ellington, near our facility.

Orbiter Transport Over Bay Area Houston

5.0 Benefits to Nation

Texas has played a pivotal role in human space exploration from the early Mercury, Gemini, Apollo and Skylab programs. Today, NASA's Johnson Space Center leads the Space Shuttle, International Space Station and Constellation programs. The shuttle was designed and developed here. Houston is also home to Mission Control and the Astronaut Corps. Space is part of the very fabric of the Lone Star State, and having this prized jewel prominently displayed at the nation's premier location of space flight is a natural choice. It is time to bring the shuttle home.

Space Center Houston is already home to a diverse collection of space artifacts, all under one roof. Bringing an orbiter to Texas for permanent display in our nation's fourth largest city ensures that this valued treasure is available to audiences young and old who appreciate what the American space program has accomplished.

With so many amazing space-related programs, exhibits and displays in one location, Space Center Houston is the right place for further inspiring our nation to the benefits of a robust space exploration program. We take this mission seriously and have been successful in enhancing the education and discovery of the public for nearly two decades.

5.1 Inspiring the American Public and Students

The educational and inspirational impact on our children is priceless, and should not be underestimated. Our state's active role in the American space program requires an ever-increasing supply of scientists, engineers and educators in our community. This artifact on exhibit will influence an untold number of students to pursue science, technology, engineering and math (STEM) careers while satisfying their curiosities and helping them learn about the many discoveries made possible by past shuttle missions.

As the orbiter and main engines will be located in our new education and learning facility, students are the greatest benefactor of this exhibit. Our education department was launched just after we opened and incorporates the National Science Education Standards and Texas Essential Knowledge and Skills into our programs.

Hands-on Education at Space Center Houston

The educational staff has grown from three full-time to 14 full-time and 20 part-time employees. In addition, over 70 volunteers assist our education efforts. The department has multiple innovative and progressive learning programs using the latest technology and up-to-date teaching methods. We educate nearly 100,000 teachers and students annually from around the world regarding the nation's space program.

Corporate-supported programs have been highly successful. As examples, the *BP Physics Challenge,* now in its fourth year, involves over 1,200 Harris and Galveston County physics and math high school students in a day of hands-on science. NASA, Boeing, the Albert & Ethel Herzstein Charitable Foundation and Southwest Airlines are sponsors of the annual *Space Exploration Educators Conference*. In its fifteenth year, this growing three-day event now provides over 190 session selections for 580 teachers and informal educators from around the nation.

JSC moved its Educators Resource Center (ERC) to Space Center Houston in 1997. This is a significant source of free curriculum materials, research tools, videos, books and magazines for teachers, designed to enhance math and science literacy among students across the country. The ERC has serviced more than 50,000 educators from 1997 through 2008.

The following sections detail myriad attractions, exhibits and education programs already available at Space Center Houston. With the addition of the orbiter, we anticipate the development and implementation of numerous programs that further share the glorious mission of space exploration with all future generations of visitors.

5.2 Current Educational and Outreach Activities

Space Center Houston is the ideal destination for education and outreach initiatives. From on-site attractions and tours to overnight visits and day camps, there are numerous ongoing activities that share the wonders of space exploration.

5.2.1 Attractions and Exhibits

Although we are constantly changing out many of our exhibits to keep the experience fresh and exciting, the following is a summary of our more permanent attractions and exhibits.

- **Starship Gallery -** In this large format film theater, the spellbinding movie "On Human Destiny" is shown, highlighting great moments in space exploration. The gallery contains artifacts and hardware from the Mercury program through Apollo-Soyuz, including a special lunar vault that houses actual moon rocks. Already in place are several display items from the shuttle era.
- **Blast Off** - One of our newest permanent attractions, "Blast Off" is an unparalleled multi-media sensory experience. Visitors experience a dramatic high-definition video and audio extravaganza culminating in a dramatic space shuttle lift off.
- **Giant Screen Theater** –Texas' largest giant screen theater shows the breathtaking space-themed films "To Be an Astronaut" and "Space Station."
- **The Feel of Space -** A hands-on exhibit where guests can test their skills at landing the shuttle, retrieving a satellite and planning a mission to Mars through interactive computer simulators. A mission briefing officer gets help from audience members in a live presentation showing how astronauts handle daily activities such as showering, sleeping and preparing meals in space.
- **NASA Tram Tour -** A 90-minute journey behind the scenes at JSC includes stops at several NASA facilities including Mission Control, the vacuum chamber, Rocket Park and the Space Vehicle Mockup Facility.

- **Astronaut Gallery** - This unparalleled exhibit features spacesuits dating back to the first American exploration into space and a wall that contains portraits and crew photos of every U.S. astronaut who has flown in space.
- **Mission Status** - Mission briefing officers provide live updates on current space flights and astronaut training activities. Visitors can listen to communications between Mission Control and astronaut crews aboard the space shuttle. A live video shows a behind-the-scenes view of activities at JSC and a look into what is going on in the space program today.
- **The Martian Matrix** - Four stories of out-of-this-world fun for kids. Pepsi-sponsored Martian Matrix is an action-packed play area with an awesome space theme. Slides, swings and foam ball battles are just a few of the featured activities.
- **Kids Space Place** - Interactive stations and themed areas give children a chance to investigate the different aspects of space exploration. Jumping on the moon, manning the space shuttle, building a rocket and flying in space are all a part of this growing exhibit.
- **The International Space Station (ISS)** – Along with a 1/12 scale high-fidelity model of the ISS, a kiosk provides visitor-initiated activation of lasers highlighting the different components. There is also a model of an ISS node where patrons take a virtual tour of the orbiting platform, explore the exterior of the station via a spacewalk and conduct docking maneuvers between the shuttle and ISS.

Space Center Houston Astronaut Gallery

5.2.2 Current Education Programs

Our award-winning education department provides programs for a variety of people including local, national and international students, teachers, scouts and day campers ages 4-14. Serving nearly 100,000 educators and students annually, these programs include school field trips, overnight visits, space schools, distance learning, video conferencing, professional development, scout camp-ins, day camps and outreach programs. We work closely with JSC's education department to ensure we have the best, most up-to-date education and outreach content available, ensuring an emphasis on the changing demographics of our nation's student body. Our programs reach a diverse economic stratum including children living in remote and under-privileged areas. Following is a summary of our current educational initiatives for teachers, students and the general public as well as more detailed information that spotlights a few of our capstone programs.


Students Visit Orbiter Exhibit with an Astronaut

Educational Initiatives

- **School Visit Overnights** - Developed specifically to accommodate out-of-town school groups, this program takes the stress out of planning an overnight trip. This program includes exciting mission activities, selected meals, private tram tour and can include hotel accommodations.
- **School Visits -** Space Center Houston is the ideal destination for any school's field trip. With enough exhibits, films and tours to fill an entire day, students are guaranteed to have a blast.
- **Home School Day** - Designed specifically for home-school families, this event incorporates hands-on activities, presentations, and interactive activity guides to make a fun and educational day for the entire family.
- **Orbital Outreach** - For libraries and schools who can't make it to Space Center Houston, we bring intelligent fun to their doors. Orbital Outreach Programs are an exciting and affordable way to bring space science to schools worldwide. Our traveling staff provides hands-on, minds-on activities with live presentations for small or large groups of 30-100 students.
- **Educator Open House** - Space Center Houston hosts a free open house for all educators each fall. Educators attend sessions, tour the center, view films, and register to win great door prizes while earning professional development credit.
- **Johnson Space Center's Educator Resource Center (ERC)** - Helping teachers bring space into their classroom, the ERC provides curriculum, videos, Podcasts, posters and more. These standards-based resources are available at no cost. This ERC serves a five-state region, and teachers can either visit the ERC or obtain information via website or e-mail
- **Virtual Space Community -** This program seeks to bring together partners from all across the nation to develop a network that promotes STEM fields in science center, schools and communities through interactive and hands-on space-themed education resources. The VSC is centered on a website (www.virtualspacecommunity.org) which allows for the sharing of ideas and events and gives access to NASA curriculum and experts.
- **Scout Camp-Ins** - Scout camp-ins provide an out-of-this-world experience for Boy Scouts, Cub Scouts and Girl Scouts. Each camp-in is geared to meet specific badge requirements for each level of scout. Scouts enjoy an evening of activities in the center, breakfast the following morning, a large screen film in our Northrop Grumman Theater and a private tram tour of JSC.
- **Day Camps -** We offer day camps for kids ages 4-14 during spring break, winter holiday break and the entire summer. Campers can build and launch model rockets, design their own robot, construct a model of the International Space Station, learn about life in space, and much more.
- **Space School** - Students from all over the world experience our one-of-a-kind engineering challenge as students spend five days on a mission to Mars. High school students design and build their own rockets, robotic rovers, orbital lofting devices and landers, and they provide science-themed presentations as students compete for the week's top prize. Participants have the opportunity to tour NASA facilities and talk with scientists and engineers who are experts in their fields.

Space Center Houston Visitor Learns About Life in Space

- **Space Exploration Educator Conference (SEEC)** - SEEC is a conference held every year only at Space Center Houston and is an educational opportunity of a lifetime. SEEC is the only one of its kind in the United States. This conference is for educators who teach grades K-12, and is not just for science teachers. We strive to use space to teach across the curriculum. The activities presented at SEEC can be used for science, language arts, mathematics, history and more. The conference, held each February, is three days of complete immersion into space exploration, where teachers can attend more than 180 sessions hosted by the actual scientists and engineers working on these exciting endeavors, including the International Space Station, Mars exploration, Hubble telescope, Constellation Program and the planets beyond.

  Over 600 educators attend each year to hear from the astronauts leading the charge in exploration and from their peers by attending sessions presented by other educators. Teachers from all over the world are provided wonderful networking abilities and receive a multitude of cross curriculum ideas and activities that they can take back to the classroom, all while receiving 24 hours of continuing professional education credit. Those that attended the fifteenth annual SEEC conference included science educators around the world and representatives from JSC, Glenn Research Center, Ames Research Center, Jet Propulsion Laboratory, Lockheed Martin, The Boeing Company, Kennedy Space Center, ERCs, NASA Headquarters, Japanese Aerospace Exploration Agency, UK Space Science Center and several universities including Rice University.

"Upon return my teachers said that SEEC was the best experience in their educational careers. Considering that most of the teachers I brought have taught over 15 years, that is a magnificent complement for you and your staff."

~ Jennifer Hale Webb, Science Curriculum Lead Teacher, Little Rock School District

- **BP Physics Challenge** - The BP Physics Challenge is a partnership amongst Space Center Houston, BP America (BP) and five area school districts (including Houston Independent School District, the fourth largest in the nation), designed to excite, motivate and teach inner city high school students about physics. The program, which was awarded the Crystal Award for Best STEM Business Partnership from the Texas Association for Partners in Education, involves educational curriculum that improves student performance in physics and math, improves educators' ability to teach physics and math and increases the number of students going into STEM fields of study following high school. In order to accomplish these goals, the BP Physics Challenge includes a two-day teacher professional development workshop, a mentor component offering training for BP employees to learn how to work with the students, and a one-day field experience where students conduct physics activities in a real-world setting. These kids meet employees from BP and engage in a discussion with an astronaut who has flown in space. Afterwards, mentor employees from BP follow up with the students by visiting their classrooms and sharing what they do at BP.

  The BP Physics Challenge has been in place for four years. During this time, 120 math and physics teachers have participated in the professional development workshop, 150 scientists and engineers from BP mentored and interacted with the students, and 4,000 students representing 33 high

schools have participated. This past year, the event activities and content have been integrated into the HISD curriculum as part of the required objectives. The hands-on experiments and calculations crystallize their understanding of not only the required curriculum, but also increase student interest in working in science fields as evidenced by the comments on the student evaluation forms and their many questions to the industry mentors and speakers.

- **Distance Learning/Video Conferencing** - Space Center Houston is at the cutting edge of educational technology. The education department has developed a variety of award-winning technology-rich educational events for those unable to visit our complex. The first type of distance learning programming developed, in partnership with Ball State University, included three electronic field trips (EFT). These trips use technology to make resources available to a large, national audience via the internet. The EFT programs include "*Where are all the Little Green Men?", "Under Water World of Space" and "Where is that Zero-G Room*?" Online programming includes a live interactive webcast using NASA facilities such as Ellington Airport and the Neutral Buoyancy Laboratory. In addition, educational webisodes, discussion forums, interactive games, and lessons were developed for the EFT teachers and students. We secure astronauts, engineers and scientists from JSC to assist with the activities. During the live webcast, viewed by thousands of students, we host the Ball State production crew, coordinate on-screen talent and provide in-house space experts. These programs have been twice honored with the Telly Award, which recognizes the very best local, regional and cable television commercials and programs, as well as the finest video and film productions and work created for the web. Annual Telly awards receive over 14,000 entries from all 50 states and five continents.

In addition to all of these exciting and unique programs and attractions, Space Center Houston is home to all crew-return public debriefs and JSC awards ceremonies for each space shuttle mission and ISS Expeditions. Our facility and staff also host community fundraising events, galas and other large-scale events in support of aerospace initiatives and industry accomplishments.

5.2.3 Potential Orbiter Programs

Through development of the expanded education and learning center, new programs leveraging home-grown space experts available throughout Texas and JSC will be implemented. The educational programming includes expanding our already developed programs by enhancing the educational content and experiences around the shuttle and accompanying exhibits. We will develop new scout modules, school programs and public programs that utilize the orbiter and shuttle-based displays, leveraging the experience we have in hosting and educating more then 100,000 teachers and students annually.

Interactive "Land the Shuttle" Exhibit

New programs include engaging local community colleges and "early college" high schools by holding a series of classes that count as credit towards their student's college degrees. We currently have partnerships with the University of Houston-Clear Lake and San Jacinto College, a recognized Hispanic serving institution. Classroom areas attached to the shuttle building will have high-tech capabilities including webcasting, video conferencing equipment and computer

labs. The classes will be approved by the State of Texas and the Department of Education and allow students to perform real-world scenarios centered on the shuttle technology program. Partnerships with local aerospace contractors will allow for skill enhancement courses, workforce certificate training, aerospace technology associate degrees and systems engineering for professionals. In addition, the courses could be taught world-wide to a variety of audiences using distance-learning capabilities from the classrooms including video conferencing and web-casting technologies, using equipment already in place.

Our camps and space school programs reach a variety of audiences and age groups and would be enhanced with virtual experiences, interactive exhibits and space shuttle simulations. These enhancements will include a space shuttle technology transfer program that provides information regarding the spin-offs developed by the shuttle program and assists the learner in developing a new technology to solve a current problem. Students will also be able to manipulate a robotic arm, walk through and participate in a space food preparation laboratory, build and test glovebox experiments, participate in astronaut survival skills, become inspectors and engineers who test safety and vehicle preparedness and also participate in virtual reality experiences that replicate an actual space walk to repair parts of the ISS and the Hubble Telescope.

Space Center Houston and JSC's education departments will work together to enhance the Texas Aerospace Scholars program, a state-approved program for high school students, middle school teachers and community college students. Since beginning in 1999, more than 4,500 students have been nominated by their state delegates to participate, with 100 percent of the state's districts represented. In addition, teacher professional development courses will be provided by the education staff. This allows educators to take the shuttle experience and produce real-world classroom activities that meet their students' specific state learning standards. Space Center Houston is an approved and certified institution authorized to provide continuing education credits to educators around the nation who teach early childhood through high school students.

As with our current facility, the new shuttle building will be used seven days a week with hands-on, immersive educational activities that teach concepts from physics to biology to the mechanics of flight for a wide variety of audiences. Experiential learning at science centers is imperative for our communities and their educational literacy and growth. The space shuttle is one of our nation's greatest technological feats, and utilizing the exhibit as a means for educating groups about the science and technology that got us to low Earth orbit is our imperative mission, one that we look forward to implementing.

5.3 Assess, Evaluate and Measure Objectives

Space Center Houston is one of Texas' top attractions, and since its opening in October 1992 has educated and entertained more than 12 million visitors of which 70% have taken the tram tour to JSC. In the latest visitor survey 86% of the participants rated the tram tour Excellent, an outstanding score when held to industry benchmarks collected by independent survey experts. In fact, industry benchmarking and customer satisfaction assessments are a vital part of our ongoing operations, both as a venue and from an education and outreach perspective.

The Apollo Exhibit - a Space Center Houston Favorite

5.3.1 Venue Assessments

Numerous methods are used to measure and assess the customer experience at Space Center Houston. We are exceptionally proud of our results, which are continuously above industry standards.
Each month, since opening our doors in 1992, we have had the same professional third-party organization conduct interviews and take a representative sample of our guests to obtain comments regarding visitor experience, feedback on our facility and suggestions for improvement. We use this data to benchmark and improve our intelligent fun experience unique to Space Center Houston. We also encourage our guests to complete comment forms available at the information desk or posted online at our website.

In a recent analysis conducted by the Morey Group, an organization that specializes in conducting surveys for not-for-profit cultural attractions such as museums, zoos and aquariums, our results showed that *all* ranked categories were above industry benchmarks and were still trending upwards from prior surveys. Notable categories include overall satisfaction, admission value, entertainment and educational experience, courtesy and cleanliness.

Additional assessments ranked Space Center Houston against other tourism locations such as the California Academy of Sciences, Long Island Children's Museum, Natural History Museum of Los Angeles County, New York Hall of Science, the Washington State History Museum and a dozen other venues. Results showed that Space Center Houston rated highest for entertainment experience and was a leader in overall satisfaction, value and educational experience.

In addition to peer rankings and guest satisfaction ratings, we strive to keep the experience affordable. Admission prices have seen only modest gains over the years, allowing for a broader attendance of the general public. Promotions further reduce the cost of admission, and a fund for Title 1 schools is available to ensure audiences of diverse economic strata are able to enjoy our complex.

To keep management abreast of industry trends, curatorial and education standards and innovative approaches for operating museums and theme parks, Space Center Houston is a member of several organizations including: International Association of Amusement Parks and Attractions, Association of Science-Technology Centers, National Science Teachers Association, and local convention and visitor's bureau organizations as well as the Clear Lake Area Chamber of Commerce.

5.3.2 Education Program Assessments

Providing educational programs and events is a cornerstone of the activities offered at Space Center Houston. We are diligent about collecting statistics and feedback regarding our various programs. Currently, the educational programs are assessed using an outcome-based evaluation approach that asks the guests of the program to complete a post-event survey that is audience specific. For instance, we give evaluations to every scout leader at our scout camp-in program and also to every parent and teacher that attend the school visit overnight program. Also, the students and scouts are given evaluations to see how they perceived the program.

Star Gazer Mascot Greets Students at Space Center Houston

The evaluations are thoroughly reviewed after each event and input into a database to evaluate the scope of our overall impact and productivity for the year. For the school visit program, a professional online survey is sent to our teachers to check on their reservation experience. A follow-up survey is given to them and, if they turn it in at the end of the day, they receive a free NASA poster as an incentive for providing us valuable feedback.

5.3.3 Future Assessments

Once the facility encompassing the orbiter, engines and related space shuttle artifacts is open to the public, we will further enhance our surveys and assessments. Added analysis on crowd control, customer experience and safety will be employed to ensure our visitors are safe and happy. As with all of our educational programs, we will maintain participation statistics, educator and student assessments and analyze the programmatic value to our users.

It will be important for our new educational programs, especially with the community college course programs, to be evaluated on the front end via a needs assessment, and continue to be evaluated by both quantitative and qualitative methods. For the first few years, a professional evaluator will be asked to monitor the programs and produce reports that allow all stakeholders to have input on content, process and impact.

6.0 Techniques and Interpretive Strategies

As demonstrated in a recent survey, adding the space shuttle orbiter to our growing collection of unique space artifacts will increase public attendance and boost enrollment in our myriad programs. It is anticipated that we will create a total space immersion experience, not just a static display, centered on our nation's most prominent human-ferrying space vehicle.

6.1 Promoting Space Exploration

As JSC is home to astronaut training, mission control and all facets associated with human space flight, our focus is to share these exciting aspects of space exploration with the public. Themes will focus on:

- Going to space – what are the benefits?
- Training for the space environment – fitness, tasks and contingencies
- Preparing for a mission – getting packed, both the vehicle and the traveler
- Getting to space – propulsion, systems, vehicles, mass and more
- Living in space – what is different about a low gravity environment?
- Working in orbit – how does low gravity impact science investigations?
- Staying fit in low gravity – nutrition and exercise
- Getting home – safety and the transition back to gravity
- Analyzing results – looking at the outcomes of the many space experiments

6.2 Other Techniques

With the development of a new facility we have the opportunity to add unique learning and experiential activities to help facilitate the overall space experience. We anticipate providing the following:

- Offering inspirational movies regarding the accomplishments of the shuttle program and space flight
- Operating classrooms for a more in-depth student and teacher learning opportunity using the space shuttle as the centerpiece

Appendix

RFI Contact Information

- **Name of the primary point of contact for the response:** Richard E. Allen, Jr.
- **Academic faculty or business title:** President, Manned Space Flight Education Foundation, Inc. and Chief Executive Officer, Space Center Houston
- **Institution or organization affiliation:** Manned Space Flight Education Foundation, Inc., through its sole project, Space Center Houston, the Official Visitor Center of NASA's Johnson Space Center
- **Email address:** richarda@spacecenter.org
- **Phone:** (281) 244-2120
- **Identification of other key individuals who collaborated on the RFI response:**

Manned Space Flight Education Foundation, Inc. Board of Directors and Officers

- ***Joel B. Walker*** - Chairman, Manned Space Flight Education Foundation, Inc. and Director Center Operations Directorate, Lyndon B. Johnson Space Center
- ***Ronald A. Kapche*** - Vice Chairman, Manned Space Flight Education Foundation, Inc. and Chairman, TEI Staffing
- ***Richard E. Allen, Jr***. - President, Manned Space Flight Education Foundation, Inc, and Chief Executive Officer, Space Center Houston
- ***Janet L. Brown*** - Secretary/Treasurer, Manned Space Flight Education Foundation, Inc. and Director of Finance, Space Center Houston
- ***Ellen E. Conners*** - Director, External Relations, Lyndon B. Johnson Space Center
- ***Pat Cunningham*** - Retired CEO
- ***George A. DeMontrond, III*** – President, DeMontrond Automotive Group, Inc.
- ***Susan H. Garman*** - Retired NASA, Lyndon B. Johnson Space Center
- ***Frans Gillebaard*** – Retired
- ***Glenn A. Goerke*** – President Emeritus, University of Houston
- ***Fred Griffin*** - Chief Executive Officer and Chairman, Griffin Partners, Inc.
- ***Richard J. Hieb*** - Vice President, Lockheed Martin Information System and Global Services - Civil
- ***Bill King*** - Attorney at Law, Bracewell & Giuliani LLP
- ***Michael Mithoff*** – President, Teton Strategic Investments, Inc.
- ***Dennis E. Murphree*** - Managing General Partner, Murphree Venture Partners
- ***Ellen Ochoa*** - Deputy Director, Lyndon B. Johnson Space Center
- ***Jim Reinhartsen*** - Vice President, Bay Area Houston Economic Partnership
- ***Natalie V. Saiz*** - Director, Human Resources, Lyndon B. Johnson Space Center
- ***Randa Duncan Williams*** - President, EPCO, Inc.

Bay Area Houston Economic Partnership Executive Committee

- ***Bob Mitchell*** - President, Bay Area Houston Economic Partnership
- ***Barry Beasley*** - Director External Affairs, AT&T
- ***Jennifer Bowers*** - Partner, Bowers & Sadler, LLP
- ***Gale E. Burkett*** - President, Chief Executive Officer, GB Tech, Inc.
- ***Richard O. Covey*** - President, Chief Executive Officer, United Space Alliance
- ***Robert Elberger*** - President, Concorde Realty Development
- ***Bob Ellis*** - Group President, Wyle, Integrated Science & Engineering Group
- ***Frans Gillebaard*** - Retired
- ***Dick H. Gregg, Jr.*** - Attorney at Law, President, Gregg & Gregg, P.C.
- ***Sandy Johnson*** - President, Barrios Technology
- ***William Lindemann, M.D.*** - Chancellor, San Jacinto College District
- ***Lon F. Miller*** - Sr. Vice President, General Manager, Jacobs Engineering
- ***Bernard A. Milstein, M.D***. - President, The Eye Clinic of Texas
- ***Dennis W. Peterson*** - President, Lockwood, Andrews & Newman, Inc.
- ***Brewster Shaw*** - Vice President, General Manager, The Boeing Company
- ***William A. Staples, Ph.D.*** - President, University of Houston-Clear Lake
- ***John Wilkins*** - Vice President, Lockheed Martin

Other Participants:

- ***Gwen Griffin*** - Managing Director, Griffin Integrated Marketing
- ***Kimberly Campbell*** - Senior Consultant, Griffin Integrated Marketing
- ***Gerry Griffin*** - Former Center Director, Lyndon B. Johnson Space Center
- ***Melanie Johnson, Ed.D.*** – Director of Education, Space Center Houston
- ***Richard H. Sanger Jr.*** - Director of Development, Space Center Houston
- ***Paul Spana*** - Exhibits Manager, Space Center Houston

A Brief Summary (300 Word Limit) Description of Previous Relevant Experience in Displaying Assets of National Significance:

Manned Space Flight Education Foundation, Inc. is a Texas non-profit corporation and a 501(c)(3) tax-exempt organization. It was organized in 1986 to solely construct and operate the Official Visitor Center of NASA's Johnson Space Center – Space Center Houston. Initial funding for the visitor center came from the issuance of tax-exempt bonds through the Harris County Cultural Education Facilities Finance Corporation. The facility was completed and opened to the public in October 1992.

With a mission to be a world-class attraction dedicated to inspiring, entertaining and educating every generation about space exploration and its benefits to humankind, Space Center Houston is the gateway to the Johnson Space Center. This $69-million, 183,000-square-foot *intelligent-fun* complex has entertained and informed more than 12 million star-struck guests from every corner of the globe.

Space Center Houston attracts nearly 750,000 visitors per year. The facility operates over 250 educational programs each year including: space school, day camps and the BP Physics challenge for high-school math and physics students. In addition, it offers international educational exchange programs which involve students from over 40 countries.

Since 1992, Space Center Houston has displayed some of the nation's most elite flight articles flown in space. With a long-standing history of showcasing rare artifacts, exhibits include a lunar lander, Saturn V rocket, moon rocks, a Skylab trainer and space capsules from Mercury, Gemini and Apollo missions. With an established partnership with JSC's External Affairs and their exhibits personnel, Space Center Houston has the necessary processes and procedures in place to ensure quality control, proper display and exceptional care of all display items. In addition to facilitating the care of displays and exhibits, Space Center Houston has standard operating procedures that support the operations, maintenance and customer experience of the entire facility.

Mission Statement

The mission of ***Manned Space Flight Education Foundation, Incorporated*** is to educate the public about the space program with Space Center Houston as the cornerstone of its efforts. The Foundation and its board will direct, advocate and be instrumental in achieving support for the mission and vision of Space Center Houston. They will ensure that the center:

- Maintains financial viability
- Is accessible to the public
- Attracts the widest possible community endorsement from the public, community and corporate leaders, philanthropic foundations, government agencies and other appropriate organizations and individuals
- Possesses the professional management to achieve its mission and vision

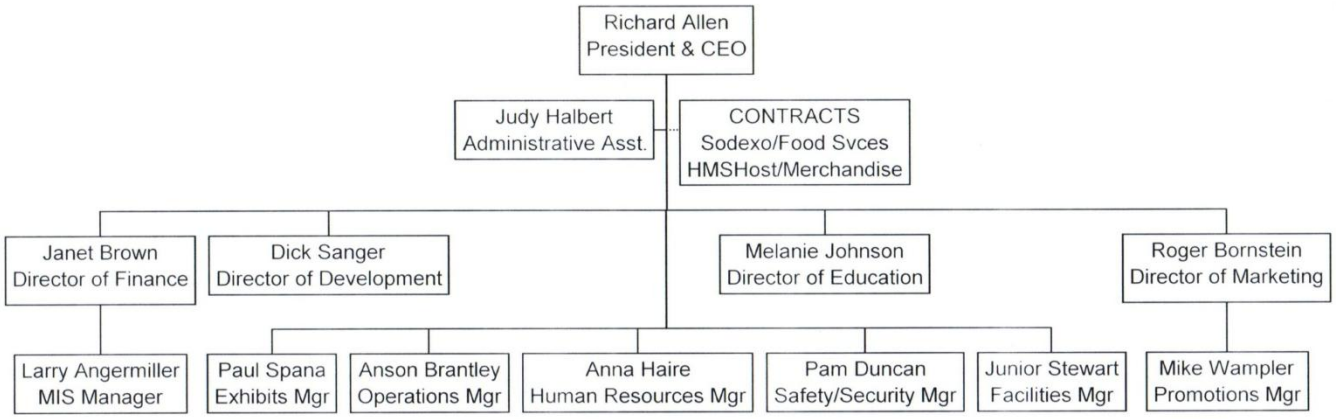
The mission of ***Space Center Houston***, the gateway to Johnson Space Center and the astronauts, is to be a world-class attraction and center of excellence dedicated to inspiring, entertaining and educating every generation about:

- Space exploration
- Those who reach for the stars
- Related areas of science and technology
- The benefits of space exploration to human kind

Nature of Governing Authority

The Manned Space Flight Education Foundation, Inc. (MSFEFI) was formed as a 501(c)(3) educational, non-profit corporation by community leaders and representatives from JSC to develop a visitor center with ticketed admission to ensure the education for every generation about space exploration and related areas of science and technology. Governed by the Restated Articles of Incorporation and the Amended and Restated Bylaws dated December 9, 2008, MSFEFI is a non-profit, non-stock, non-membership Texas corporation.

2009 Space Center Houston Organizational Chart



Accreditation or Other Relevant Credentials

As a 501(c)(3) educational, non-profit organization, Space Center Houston is the Official Visitor Center of JSC. In addition, the State of Texas issued MSFEFI a Certificate of Incorporation pursuant to the Texas Non-Profit Corporation Act in 1986.

MSFEFI is a non-profit education corporation. We file a Return of Organization Exempt from Income Tax Form 990 with the Internal Revenue Service annually as required by its non-profit policies.

In addition, unlike most museums, our Secretary/Treasurer of MSFEFI and Director of Finance, Space Center Houston is a CPA licensed by the American Institute of Certified Public Accountants and Texas Society of Certified Public Accountants. The Director of Education of Space Center Houston has an Ed.D. degree and the educational staff specialists and curriculum coordinators are State Board of Education Certified. They are also authorized by the Texas State Board of Education to provide continuing education units to educational professionals.

Based on the annual revenue and the ability to raise capital, our historical coverage of maximum annual senior debt service has been consistently more than twice the required amount, demonstrating financial security and stability. As a result, Standard & Poor's raised our bond rating in 2008 to BBB-. MSFEFI has always been awarded a clean opinion by its auditors in annual audits of the company's financial statements and operating practices.

We also file our financial statements with Dun & Bradstreet, making all information available to the public, further elevating its financial rating. The Better Business Bureau reviews all filings; ensuring operations meet not-for-profit giving guidelines. We participate in a full, certified audit, continuously upholding ourselves to the highest standards of financial performance and scrutiny.

Collection Ownership and Management Policy

With facility reports and loan agreements in place with JSC, we are able to exhibit numerous National Air and Space Museum (NASM) artifacts and we are entrusted with their care and conditioning. The facility reports detail how we ship, store, handle, display and safeguard the facility and its assets, ensuring their security and protection from people, the environment, contaminants and natural degradation. Artifact displaying strictly adheres to American Association of Museums and NASM standards. Additionally, we work hand-in-hand with JSC personnel, whenever required, adhering to NASA Procedural Requirement 4310.1 - Identification and Disposition of NASA Artifacts. We are in the process of implementing a comprehensive preservation management plan, funded through a grant received from the Institute of Museum and Library Services.

Attendance Figures for Each of the Past 5 Years

Historical Attendance Space Center Houston		
Fiscal Year	**Total Attendance**	**Attendance Revenue**
2004	704,297	$8,339,749
2005	715,185	$7,859,144
2006	663,797	$8,587,352
2007	702,215	$9,120,831
2008	715,934	$9,258,789
Total	***3,501,428***	***43,165,865***

Population of Geographic Area in Which Organization is Located

Space Center Houston is located within the Houston Metropolitan Statistical Area (MSA), which covers approximately 5,961 square miles. As of the second quarter in 2008, the Houston MSA includes a population of 5,864,253 million people.

Number of Web Page Hits for Each of the Past 5 Years

2008	**2007**	**2006**	**2005**	**2004**
815,130	660,596	614,240	575,883	530,768

- Providing manipulative activities that teach various aspects of space benefits and travels
- Incorporating unique exhibits and hands-on activities using robotics, virtual reality and other inspirational techniques
- Showcasing a variety of shuttle trainers, equipment and astronaut tools that add to the overall shuttle exhibit experience

7.0 Needs from NASA for Display

Space Center Houston and JSC have a solid partnership, overseeing the care and display of some of the world's most rare space artifacts. Through this cooperation much of the work needed to appropriately display the space shuttle orbiter and engines will be coordinated between these two entities. However, support from NASA in the areas of transportation and set-up and supplementary display items may be requested.

7.1 Logistics

During the transportation and set-up of the orbiter, support from NASA may be desired. Current plans would be to have the orbiter flown into Ellington Airport, located just eight miles from Space Center Houston. This approach and facility has proven successful in the past for transporting space-flown artifacts. Ground support equipment, expertise, analytical data and related information for transporting and safe-housing the orbiter would be of benefit for secure transfer to its new home.

7.2 Supplemental Equipment and Displays

To make the visitor experience complete, we will be requesting shuttle trainers and equipment from NASA that are scheduled for decommissioning. Items such as shuttle simulators and trainers, rocket boosters, docking adapters and rings, models, shuttle tiles and blankets, EVA tools, mid-deck lockers and stowage bags, hygiene station, exercise equipment, space suits and other items would be of educational benefit to our educators, students and patrons. This supplemental equipment will help turn a static display into a total space experience, showcasing the ability for humans to visit, work and live in space.

8.0 Summary

Located in the fourth largest city in America, Space Center Houston is a premier venue for educating the public on the value and benefits of space exploration. The complex features many of our nation's most treasured space artifacts in an educational environment that stimulates the imagination and encourages learning fun. Space Center Houston provides:

- Intelligent fun to more than 750,000 visitors annually
- Nearly two decades of extensive experience working with JSC and NASM
- Demonstrated, effective custodial care of cherished space artifacts
- Extensive, award-winning education and outreach activities
- Proximity to Mission Control, the Astronaut Corps and human space flight training facilities
- A financially sound business model with a solid record of performance

As part of the epicenter for human space flight endeavors and birthplace of the space shuttle, there is no more suitable location than Texas and Space Center Houston for displaying an orbiter and main engines – true embodiments of our nation's ability to explore and discover the universe. Welcome home…